

Appl. No. 09/885,804
Amdt. Dated September 15, 2005
Reply to Office action of June 16, 2005
Attorney Docket No. P11870-US2
EUS/J/P/05-3213

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for estimating channel parameters from a communications signal containing interference, the method comprising the steps of:
receiving a communications signal;
generating a baseband signal from the communications signal;
processing the baseband signal by
descrambling the baseband signal;
correlating the descrambled baseband signal with a set of spreading
sequences; and
performing maximum ratio combination correlations on the descrambled
baseband signal and the set of spreading sequences;
selecting a maximum signal from the baseband signal;
suppressing the interference when the maximum signal is not stronger the
interference; and
generating an estimate of the channel parameters from the maximum signal
when the maximum signal is stronger than the interference.
2. (Canceled)
3. (Original) The method as recited in claim 1 wherein the maximum signal
comprises a common pilot channel.
4. (Original) The method as recited in claim 1 wherein the maximum signal
comprises interfering signal components.

Appl. No. 09/885,804
Amdt. Dated September 15, 2005
Reply to Office action of June 16, 2005
Attorney Docket No. P11870-US2
EUS/J/P/05-3213

5. (Original) The method as recited in claim 1 wherein the step of suppressing the interference further comprises the steps of:

detecting one or more interference sequences;

generating a symbol estimate for each of the one or more interference sequences;

spreading the symbol estimate for each of the one or more interference sequences;

summing the spread symbol estimate for each of the one or more interference sequences to generate a composite signal;

scrambling the composite signal;

applying a channel estimate to generate an estimate of an interfering signal component of the composite signal; and

generating a new version of the baseband signal from a previous version of the baseband signal and the estimate of an interfering signal component of the composite signal.

6. (Original) The method as recited in claim 1 further comprising the step of repeating the steps of processing the baseband signal, selecting the maximum signal from the baseband signal and suppressing the interference until the maximum signal is stronger than the interference.

7. (Original) A method for estimating channel parameters from a communications signal containing interference, the method comprising the steps of:

receiving a communications signal;

generating a baseband signal from the communications signal;

processing the baseband signal to produce a first signal and a second signal;

estimating a first channel parameter from the first signal and a second channel parameter from the second signal;

suppressing the interference using a weighted average of the first channel parameter and the second channel parameter;

Appl. No. 09/865,804
Amdt. Dated September 15, 2005
Reply to Office action of June 16, 2005
Attorney Docket No. P11870-US2
EUS/J/P/05-3213

repeating the steps of estimating the first and second channel parameters and suppressing the interference when the first signal is not stronger the interference; and
generating an estimate of the channel parameters from the first signal when the first signal is stronger than the interference.

8. (Original) The method as recited in claim 7 wherein the step of processing the baseband signal further comprises the steps of:
descrambling the baseband signal; and
correlating the descrambled baseband signal with a set of spreading sequences.

9. (Original) The method as recited in claim 7 wherein the step of suppressing the interference further comprises the steps of:
generating an estimate of the channel parameters using a weighted average of the first channel parameter and the second channel parameter;
performing maximum ratio combination correlations on the processed baseband signal and the set of spreading sequences; and
selecting a new first signal using the maximum ratio combination correlations.

10. (Original) The method as recited in claim 7 wherein the first signal comprises a common pilot channel.

11. (Original) The method as recited in claim 7 wherein the second signal comprises interfering signal components.

12. (Original) The method as recited in claim 7 wherein the step of repeating the steps of estimating the first and second channel parameters and suppressing the interference when the first signal is not stronger the interference further comprises the step of selecting the second signal from a maximum signal of the processed baseband signal.

Appl. No. 09/885,804
Amdt. Dated September 15, 2005
Reply to Office action of June 16, 2005
Attorney Docket No. P11870-US2
EUS/J/P/05-3213

13. (Currently Amended) An apparatus for estimating channel parameters from a communications signal comprising:

an interference canceler coupled to a channel emulator;

a descrambler coupled to the interference canceler;

a correlator coupled to the descrambler a channel estimator coupled to the correlator;

a ~~maximal~~ maximum ratio combiner coupled to the correlator and the channel estimator;

a symbol estimator and interferer sequence detector coupled to the maximal ratio combiner;

a signal spreader coupled to the symbol estimator and interferer sequence detector;

a scrambler coupled to the signal spreader; and

the channel emulator coupled to the scrambler and the channel estimator.

14. (Currently Amended) A communications device comprising:

an antenna;

a receiver coupled to the antenna;

a transmitter coupled to the antenna;

a controller coupled to the receiver and the transmitter antenna;

a display coupled to the controller;

a speaker coupled to the controller;

a memory coupled to the controller;

a microphone coupled to the controller;

a keypad coupled to the controller;

the receiver comprising a radio frequency to baseband converter coupled to the antenna, a channel parameter estimator coupled to the baseband converter and the controller; and

the channel parameter estimator comprising an interference canceler coupled to a channel emulator and the radio frequency to baseband converter, a descrambler

Appl. No. 09/885,804
Amdt. Dated September 15, 2005
Reply to Office action of June 16, 2005
Attorney Docket No. P11870-US2
EUS/J/P/05-3213

coupled to the interference canceler, a correlator coupled to the descrambler, a channel estimator coupled to the correlator, a maximal ratio combiner coupled to the correlator, the channel estimator and the controller, a symbol estimator and interferer sequence detector coupled to the ~~maximal~~ maximum ratio combiner, a signal spreader coupled to the symbol estimator and interferer sequence detector, a scrambler coupled to the signal spreader, and the channel emulator coupled to the scrambler and the channel estimator.

15. (Original) An apparatus for estimating channel parameters from a communications signal comprising:

a descrambler;

a correlator coupled to the descrambler a first channel estimator coupled to the correlator;

a second channel estimator coupled to the correlator;

a channel averaging device coupled to the first channel estimator and the second channel estimator;

a maximal ratio combiner coupled to the correlator and the channel averaging device; and

a symbol estimator and interferer sequence detector coupled to the maximal ratio combiner, the first channel estimator and the second channel estimator.

16. (Currently Amended) A communications device comprising:

an antenna;

a receiver coupled to the antenna;

a transmitter coupled to the antenna;

a controller coupled to the receiver and the transmitter antenna;

a display coupled to the controller;

a speaker coupled to the controller;

a memory coupled to the controller;

a microphone coupled to the controller;

Appl. No. 09/885,804
Amdt. Dated September 15, 2005
Reply to Office action of June 16, 2005
Attorney Docket No. P11870-US2
EUS/J/P/05-3213

a keypad coupled to the controller;
the receiver comprising a radio frequency to baseband converter coupled to the antenna, a channel parameter estimator coupled to the baseband converter and the controller; and
the channel parameter estimator comprising a descrambler to the radio frequency to baseband converter, a correlator coupled to the descrambler, a first channel estimator coupled to the correlator, a second channel estimator coupled to the correlator, a channel averaging device coupled to the first channel estimator and the second channel estimator, a maximal ratio combiner coupled to the correlator and the channel averaging device, and a symbol estimator and interferer sequence detector coupled to the controller, the maximal ratio combiner, the first channel estimator and the second channel estimator.

17. (Currently Amended) A computer program embodied on a computer readable medium for estimating channel parameters from a communications signal containing interference, the computer program comprising:

a code segment for receiving a communications signal;
a code segment for generating a baseband signal from the communications signal;
a code segment for processing the baseband signal utilizing
a code segment for descrambling the baseband signal;
a code segment for correlating the descrambled baseband signal with a set of spreading sequences; and
a code segment for performing maximum ratio combination correlations on the descrambled baseband signal and the set of spreading sequences;
a code segment for selecting a maximum signal from the baseband signal;
a code segment for suppressing the interference when the maximum signal is not stronger than the interference; and
a code segment for generating an estimate of the channel parameters from the maximum signal when the maximum signal is stronger than the interference.

Appl. No. 09/885,804
Amtdt. Dated September 15, 2005
Reply to Office action of June 16, 2005
Attorney Docket No. P11870-US2
EUS/J/P/05-3213

18. (Canceled)

19. (Original) The computer program as recited in claim 17 wherein the maximum signal comprises a common pilot channel.

20. (Original) The computer program as recited in claim 17 wherein the maximum signal comprises interfering signal components.

21. (Original) The computer program as recited in claim 17 wherein the code segment for suppressing the interference further comprises the steps of:

- a code segment for detecting one or more interference sequences;
- a code segment for generating a symbol estimate for each of the one or more interference sequences;
- a code segment for spreading the symbol estimate for each of the one or more interference sequences;
- a code segment for summing the spread symbol estimate for each of the one or more interference sequences to generate a composite signal;
- a code segment for scrambling the composite signal;
- a code segment for applying a channel estimate to generate an estimate of an interfering signal component of the composite signal; and
- a code segment for generating a new version of the baseband signal from a previous version of the baseband signal and the estimate of an interfering signal component of the composite signal.

22. (Original) The computer program as recited in claim 17 further comprising a code segment for repeatedly processing the baseband signal, selecting the maximum signal from the baseband signal and suppressing the interference until the maximum signal is stronger than the interference.

Appl. No. 09/885,804
Amdt. Dated September 15, 2005
Reply to Office action of June 16, 2005
Attorney Docket No. P11870-US2
EUS/J/P/05-3213

23. (Original) A computer program embodied on a computer readable medium for estimating channel parameters from a communications signal containing interference, the computer program comprising:

- a code segment for receiving a communications signal;
- a code segment for generating a baseband signal from the communications signal;
- a code segment for processing the baseband signal to produce a first signal and a second signal;
- a code segment for estimating a first channel parameter from the first signal and a second channel parameter from the second signal;
- a code segment for suppressing the interference using a weighted average of the first 11 channel parameter and the second channel parameter;
- a code segment for repeating the steps of estimating the first and second channel parameters and suppressing the interference when the first signal is not stronger the interference; and
- a code segment for generating an estimate of the channel parameters from the first signal when the first signal is stronger than the interference.

24. (Original) The computer program as recited in claim 23 wherein the code segment for processing the baseband signal further comprises:

- a code segment for descrambling the baseband signal; and
- a code segment for correlating the descrambled baseband signal with a set of spreading sequences.

25. (Original) The computer program as recited in claim 23 wherein the code segment for suppressing the interference further comprises:

- a code segment for generating an estimate of the channel parameters using a weighted average of the first channel parameter and the second channel parameter;
- a code segment for performing maximum ratio combination correlations on the processed baseband signal and the set of spreading sequences; and

Appl. No. 09/885,804
Amdt. Dated September 15, 2005
Reply to Office action of June 16, 2005
Attorney Docket No. P11870-US2
EUS/J/P/05-3213

a code segment for selecting a new first signal using the maximum ratio combination correlations.

26. (Original) The computer program as recited in claim 23 wherein the first signal comprises a common pilot channel.

27. (Original) The computer program as recited in claim 23 wherein the second signal comprises interfering signal components.

28. (Original) The computer program as recited in claim 23 wherein the code segment for repeatedly estimating the first and second channel parameters and suppressing the interference when the first signal is not stronger the interference further comprises a code segment for selecting the second signal from a maximum signal of the processed baseband signal.